CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Spermophilus brunneus endemicus

COMMON NAME: Southern Idaho ground squirrel

LEAD REGION: 1

INFORMATION CURRENT AS OF: March 12, 2004

STATUS/ACTION:

___ New candidate
X Continuing candidate
___ Non-petitioned
X Petitioned - Date petition received: 1-26-01
___ 90-day positive - FR date: ___
___ 12-month warranted but precluded - FR date: ___
X Listing priority change
Former LP: 3
New LP: 6

Latest Date species first became a Candidate: 18-SEP-85

___ Candidate removal: Former LP: ___ (Check only one reason)

___ A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___ F - Range is no longer a U.S. territory.
___ M - Taxon mistakenly included in past notice of review.
___ N - Taxon may not meet the Act's definition of "species."
___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Mammal (Sciuridae)

HISTORIC STATES/TERRITORIES/ COUNTRIES OF OCCURRENCE: Idaho

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Idaho

LEAD REGION CONTACT: Scott McCarthy, 503-231-6131

LEAD FIELD OFFICE CONTACT: Snake River Basin Office, Rich Howard, 208-378-5243

BIOLOGICAL INFORMATION: (habitat, range, historic vs. current population estimates, etc.):

There are two distinct types of Idaho ground squirrels, and the current scientific nomenclature recognizes them as subspecies: the southern Idaho ground squirrel (Spermophilus brunneus endemicus) and the northern Idaho ground squirrel (Spermophilus brunneus brunneus) (Yensen 1991). Yensen (1991) thought that the two were close to species-level separation, and subsequent work has indicated that they could be validated as separate species (Gill and Yensen 1992; Gavin et al. 1999). The two ground squirrels are separated by differences in pelage coloration, pelage length and texture, cranial and external morphometrics, bacula, allelic frequencies, genetics, timing of the life history cycle, and behavior. A relatively small member of the genus Spermophilus, the mean length of southern Idaho ground squirrel males is 241 millimeters (mm) (9.4 inches (in)) and 235 mm (9.3 in) for females (Yensen 1991). The southern Idaho ground squirrel lives on lower elevation, paler colored soils formed by granitic sands and clays from the Boise Mountains, while the northern Idaho ground squirrel is found at higher elevation areas with shallow reddish parent soils of basaltic origin. Marked differences in pelage coloration are related to soil color with the southern Idaho ground squirrel being noticeably paler (Yensen 1985, 1991). The baculum of the southern Idaho ground squirrel is generally larger than its northern counterpart (Yensen 1991). Genetic differentiation between the two subspecies was also confirmed using enzyme analyses and DNA protein sequencing, both of which analyze blood constituents to determine genetic differences (Gill and Yensen 1992; Sherman and Yensen 1994).

The southern Idaho ground squirrel spends much of its time underground. Adults emerge from seasonal torpor in late January or early February, depending on elevation and micro-habitat conditions (Yensen and Sherman 1997). As with other small-eared ground squirrels in the Northwest, the adults have a short active season above ground of 4 to 5 months which is spent reproducing and foraging before the long seasonal torpor begins (Moroz et al. 1995; Yensen and Sherman 1997; Sherman 2000). Females are bred within the first few days of emerging from torpor. Young are born about 3 weeks later and emerge from the nest burrow in about 50 days. All age groups of the southern Idaho ground squirrel cease above ground activity by late June or early July to begin torpor.

A high quality diet of green vegetation and seeds is required to store enough fat to survive long months of torpor. Though dietary requirements of the southern Idaho ground squirrel have not been studied extensively (Yensen and Sherman 1997), they are likely to be similar to those of other ground squirrels in Idaho (Dyni and Yensen 1996). Southern Idaho ground squirrels are thought to prefer a selection of native species of perennial grasses and forbs that provide a reliable source of nutritious forage (Yensen and Quinney 1992; Yensen 1999; Prescott and Yensen 1999).

Southern Idaho ground squirrels are found in the lower elevation shrub/steppe habitat of the Weiser River Basin. They inhabit an area once dominated by big sagebrush (Artemisia tridentata), bitterbrush (Purshia tridentata), and a variety of native forbs and bunchgrasses (Yensen 1991). Prescott and Yensen (1999) suggested that these squirrels prefer areas with a high percentage of native cover types, especially areas with big sage; however, some non-native features may enhance their survival as well, specifically alfalfa fields, haystacks or fence lines. The predominant vegetation was formerly big sagebrush-bunchgrass-forb associations, with

bitterbrush (Purshia tridentata) found in the sandier locations (Yensen 2000b). The big sagebrush-bunch grass-forb complex has dramatically changed so that most of the former vegetative structure has been replaced by exotic annuals.

The southern Idaho ground squirrel occurs in an area about 30 x 70 kilometers (km) [48 x 113 miles (mi)] extending from Emmett, Idaho, northwest to Weiser, Idaho and the surrounding area of Squaw Butte, Midvale Hill, and Henley Basin in Gem, Payette and Washington Counties (Yensen 1991). Its range is bounded on the south by the Payette River, on the west by the Snake River and on the northeast by lava flows with little soil development (Yensen 1991). Their habitat is typified by rolling hills, basins and flats composed of lacustrine and fluvial sediments between 670-975 meters (2,200-3,200 feet) elevation.

The range of southern Idaho ground squirrels formally extended further north as far as Goodrich, Idaho in Adams County (Yensen 1980, 1991); however, recent studies have shown a severe decline in the number of occupied population sites in the northern part of their range. For example, the only known historic site in Adams County was not occupied in 1999 (Yensen 1999, 2000a).

The population of southern Idaho ground squirrels was estimated at around 40,000 in 1985 (Yensen 1999), although Yensen (2001) himself believes this estimate may have been "...2 to 10 times too high". Recent surveys indicated a persistent decline in squirrel population since the mid 1980s (Yensen 1999, 2001). A 1999 survey of 145 of the 180 known historical population sites indicated that only 53 sites (37 percent) were still occupied (Yensen 1999). Furthermore, 52 of the 53 occupied sites had what Yensen (1999) characterized as "remarkably low levels of activity." The percentage of active sites for southern Idaho ground squirrels decreases from south to north. Fifty-eight percent of the sites in Gem County still had squirrels (Yensen 1999). The percentage dropped to 46 percent in Payette County and decreased to 27 percent of the sites in Washington County. Ground squirrels were seen at only 19 of the occupied sites despite 28 person-days of careful surveys of 145 sites. Furthermore, at 18 of the occupied sites only a single individual was seen, fecal pellets were found at 13 sites, and vocalizations were heard at only one site. The only population site in the study with a high level of squirrel activity was the Weiser golf course, where control activities have been implemented each year in an attempt to exterminate the squirrels (Yensen 1999; Bruce Haak, Idaho Department of Fish and Game (IDFG), pers. comm., 2000).

During 2000, Yensen (2000b) surveyed 35 of the remaining sites that had not been surveyed in 1999. Active burrows were found at only one of the 35 sites, but southern Idaho ground squirrels were not observed. While two active burrow systems were located, many old burrows were clearly recognizable but were now overgrown with grass and weeds. The IDFG was contracted from March-June, 2000 to search 93 exchange parcels of Bureau of Land Management (BLM) lands and about 77 square kilometers (km^2) (30 square miles (mi^2)) of contiguous rangeland for southern Idaho ground squirrels (Yensen and Haak 2000). The survey produced 30 new southern Idaho ground squirrel population sites. By 2000, a total of 219 sites were known. Squirrel activity was low at all the sites surveyed. Kibler (2000) in his GIS analysis of the 219 sites, found that 98 (44 percent) were active sites, meaning that in the survey data records, evidence such as sighting of an animal, fecal material, and new burrows, was found to indicate that squirrels were present in the year 2000. Activity was not confirmed or remained undetermined at the other 121 (56 percent) population site locations. For comparison, in the

early 1980s, several thousand individuals would likely have been observed during a survey throughout the range of southern Idaho ground squirrel (Yensen 2000b).

In the spring of 2001, Yensen, in cooperation with IDFG field surveys, conducted a survey of southern Idaho ground squirrels to "...understand on a qualitative level the pattern of spatial distribution and density of southern Idaho ground squirrel populations, and then to make a population estimate for the species." (Yensen 2001). The 2001 survey "discovered" a total of 76 new sites which brought the total known sites to 295 (Yensen and Haak 2001). Survey results indicate the Gem County has the largest remaining populations, followed by Payette County and Washington County. A revised known historical range of 61 km (38 mi) north to south, and coincidentally, 61 km (38 mi) east to west was also determined. Total occupancy was estimated at 622 km^2 (240 mi^2) and population densities were 3.5 to 7.0 adult squirrels/ km^2. This gave an estimate of 2,177 to 4,354 southern Idaho ground squirrels (Yensen 2001). Results from southern Idaho ground squirrel surveys in 2002 indicated that 20 new, active population sites had been found (B. Haak, 2002).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Habitat deterioration appears to be a leading cause of the population decline of southern Idaho ground squirrels (Yensen 1999). In recent decades, invasion of exotic annuals has changed the species composition of vegetation and has altered the fire regime in a perpetuating cycle throughout much of the range of these squirrels (Whisenant 1990). Cheatgrass (Bromus tectorum) and medusahead (Taeniatherium asperum) are of limited forage value to the squirrels, have highly variable annual productivity, and now dominate much of the squirrels' range (Yensen et al. 1992; Yensen 1999). Diversity of native forbs and grasses decreases where these exotics take over, believed to limit the dietary diversity available to ground squirrels (Yensen 1999). Without the reliable and nutritious diet provided by native grasses and forbs, these squirrels are left with the highly variable productivity and nutritional value of exotic annuals. In years of low rainfall, low productivity of these exotics could prevent squirrels from storing enough fat to overwinter. For example, Yensen et al. (1992) showed that populations of Paiute ground squirrels (S. mollis) were highly unstable and prone to extinction in areas invaded by exotic annuals.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Recreational shooting of ground squirrels is common and may have a detrimental effect on populations of southern Idaho ground squirrels in some areas. Evidence of recreational shooting was found at a southern Idaho ground squirrel population site where squirrel activity recently ceased (Yensen 1999). The Idaho Department of Fish and Game (IDFG) recognizes the southern Idaho ground squirrel as a "Species of Special Concern" (IDFG 1994). Species of Special Concern by State law are protected from taking (shooting, trapping, poisoning) or possession. To date, protection from recreation shooting of the southern Idaho ground squirrel is

not actively enforced by the State. However, the IDFG has initiated a public awareness program through posters and included a one-page notice in their Upland Gamebird regulations booklet warning against shooting of the squirrel. We are not aware of any decrease or increase in shooting impacts to the southern Idaho ground squirrel from recent public awareness campaigns. While an undetermined number of southern Idaho ground squirrels has been collected during a 30 year period for scientific and taxonomic study, scientific collection is not considered a significant factor in their overall decline (Moroz et al. 1995).

C. Disease or predation.

Because the number of southern Idaho ground squirrels at occupied sites is generally small, a disease outbreak could have a severe effect on these squirrels (Moroz et al. 1995). Disease has been suggested as potentially contributing to the decline of these squirrels (Prescott and Yensen 1999; Yensen 1999), though no epizootic infestation has been noticed in either subspecies of Idaho ground squirrel (Yensen 1996; Yensen and Sherman 1997). Blood analyses to determine whether pandemic diseases are present have not been done but should be considered in the future. Plague (Yersina pestis), a contagious bacterial disease found in rodents, has not been identified in southern Idaho ground squirrels (Yensen 1996). The disease is of particular concern, once established, it could decimate the remaining small numbers of squirrels at occupied sites.

Predation has not been suggested as one of the causes of the southern Idaho ground squirrels' decline; however, predators can have a severe impact on prey populations that occur at critically low numbers. For example, badgers have been known to extirpate entire colonies of Washington ground squirrels (Spermophilus washingtoni) (Betts 1999). As with northern Idaho ground squirrels, one can assume that southern Idaho ground squirrels are preyed upon by many species including the red-tailed hawk (Buteo jamaicensis), prairie falcon (Falco mexicanus), northern harrier (Circus cyaneus), badger (Taxidea taxus), long-tailed weasels (Mustela frenata), and gopher snakes (Pituophis melanoleucus) (Yensen and Sherman 1997). Although not documented, domestic cats (Felix catus) predation could be significant at some population sites located near ranch houses where cats are kept to control mice and other rodents.

D. The inadequacy of existing regulatory mechanisms.

The International Union for Conservation of Nature (IUCN) classified the southern Idaho ground squirrel as "vulnerable" (Hafner et al. 1998). The IDFG classified the southern Idaho ground squirrel as a "Species of Special Concern" in 1981, meaning that the species is protected by State law from taking (shooting, trapping, poisoning) or possession. To date, however, protection from recreational shooting or poisoning has not been enforced by the State, and the squirrel remains vulnerable to this type of activity.

Private landowners are generally aware of the population decline of this species. Some have been very cooperative in allowing surveys to be done on their lands. One private landowner(s) has taken the initiative to begin active southern Idaho ground squirrel conservation management through a Candidate Conservation Agreement with Assurances (CCAA) with IDFG, and the Governor's Office of Species Conservation (OSC) (Soulen Livestock et al. 2002). The CCAA, approved in 2002, covers southern Idaho ground squirrel conservation on approximately 17,402 hectares (ha) (43,000 acres (ac)). During the first year of survey work, 9 new southern Idaho

ground squirrel population sites were located on Soulen Livestock Company properties (Yensen 2003). Conservation actions include translocation of ground squirrels from suitable habitat, including eliminating direct killing (i.e., shooting, poisoning, trapping), creating and posting No Shooting Signs, habitat maintenance and improvement, and restrictions on actions that disturb ground squirrels (i.e., cultivation) at occupied sites. The Service, IDFG, and OSC have initiated development of a programmatic conservation agreement covering all non-Federal land within the historical range of the species. Under this programmatic agreement, private landowners can sign up and be covered under the agreement if they are willing to implement conservation measures on their property for the southern Idaho ground squirrel. The Service has four private landowners who have agreed to develop and sign site specific agreements under this programmatic agreement format. The programmatic agreement should be completed in June of 2004 and available to landowners (Carmen Thomas, pers. Comm.., 2004).

The BLM provided funding for population surveys from 2000-2003 on BLM lands through its Challenge Cost Share Program (Yensen 2000b; Yensen and Haak 2000; Haak 2002) (Warner 2003). Additionally, plans were completed between BLM, Idaho Department of Fish and Game and Idaho Power Company (IPC) and a prototype habitat restoration study was begun in 2002 for the southern Idaho ground squirrel (Jack LaRocco, BLM, pers. comm., 2000; Jill Holderman, pers. comm., 2002). Additional surveys were completed in 2003 by IPC along 40 km of power line rights-of-way (ROW) that cross through the Weiser Basin (Carpenter and Dumas 2003). Thirty new squirrel sites were documented, 24 were occupied. Through the BLM Cost Share Program, total of 23 new sites were found on BLM lands and three new significant sites were found on private lands (Warner 2003).

Additionally, the Service has provided funding for several studies and surveys for the southern Idaho ground squirrel (Yensen 1985, 1999, 2000a, b). These surveys have documented the population status of the species and resulted in a comprehensive GIS map of population site locations (Kibler 2000). The Service also provided significant comments to the Environmental Protection Agency concerning the use of zinc phosphide, a chemical used to control rodents on public lands. This resulted in the chemical being subject to conditions and restrictions in those counties where the southern Idaho ground squirrel is found (J. Jones, Environmental Protection Agency, in litt., 2000). Other regulatory threats to the species may include the control of grasshopper infestations by the Natural Resources Conservation Service through the application of chemicals. Though this has not occurred yet, an alert for an infestation was initiated in the spring of 2000. Subsequently, the agencies preparing for the application determined that the infestation had been suppressed due to much wetter spring weather conditions.

The Service has made State and Federal agencies aware about the population decline of the southern Idaho ground squirrel. However, there is no requirement for an agency to conference with the Service for an unlisted or candidate species. As a candidate species, the Service can enter into candidate conservation agreements with landowners, and also provide section 6 funding for the State.

E. Other natural or manmade factors affecting its continued existence.

Ground squirrels are considered to be pests by many farmers and ranchers (Prescott and Yensen 1999). When available, alfalfa crops are one of the preferred food sources for southern Idaho ground squirrels, resulting in localized crop losses during years of high squirrel populations

(Prescott and Yensen 1999). Yensen (1998) suggested that use of pesticides associated with crop production and insect infestation may also play a role in the decline of this species. Badgers are often attracted to population sites of ground squirrels, where they dig large holes in the ground that can be dangerous to livestock (Prescott and Yensen 1999). Efforts to control ground squirrel populations are frequently undertaken regardless of species and most often include shooting or poisoning. Control efforts can adversely affect population sites of southern Idaho ground squirrels (Yensen 1998, 2000a; Prescott and Yensen 1999). USDA-Wildlife Services has been made aware of our concerns and coordinates their control work of rodents to avoid control programs in the vicinity of southern Idaho ground squirrels. The population site containing the greatest known number of southern Idaho ground squirrels is located at the Weiser Golf Course. Control efforts were terminated at the golf course by 2001 when a trapping and relocation program was initiated by the Idaho Department of Fish and Game (Haak 2002).

Competition with Columbian ground squirrels (Spermophilus columbianus) may constitute a threat to the continued existence of southern Idaho ground squirrels. The restricted range of Idaho ground squirrels occurs within the much wider range of the Columbian ground squirrel, and they occur sympatrically in some localities (Dyni and Yensen 1996). Southern Idaho ground squirrels are limited by interspecific competition with Columbian ground squirrels (Moroz et al. 1995; Yensen and Sherman 1997; Haak 2000), including competition for burrow sites (Haak 2000) and for food resources (Dyni and Yensen 1996). Where the two species occur sympatrically, Columbian ground squirrels occupy the more productive, mesic habitat with deeper soils (Yensen 1980; Dyni and Yensen 1996; Haak 2000).

Habitat destruction and fragmentation have resulted in a distribution of relatively isolated population sites of southern Idaho ground squirrels. Isolation of these small populations may play a role in the decline of this species. For example, genetic evidence indicates that different populations of the northern subspecies are isolated enough to be genetically distinct from one another (Yensen and Sherman 1997; Gavin et al. 1999); this is likely to be the case for the southern subspecies as well. Small, isolated populations are more susceptible to natural disasters, catastrophic invasions of predators, parasites, or diseases, and suffer from loss of in viability associated with genetic drift and inbreeding (Moroz et al. 1995; Gavin et al. 1999).

It is apparent from population surveys and the dramatic habitat changes during the past 30 years that there has been a population decline of the southern Idaho ground squirrel. Many of the remaining habitat and associated population sites are vulnerable to one or more man made and naturally occurring threats. The persistence of invasive exotic plants and associated changes in fire frequency has made much of their remaining habitat less suitable. The low number of squirrels observed at many of the known population sites increases the risk of extirpation. However, increased interest in this species due to recent cooperative monitoring and survey efforts, habitat reclamation and restoration plans under development by the BLM and the implementation of a CCAA and development of programmatic conservation agreement with private landowners is encouraging. There still are threat factors that may act singly, in combination, or synergistically to affect population numbers, productivity and induce genetic isolation and drift.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

Preliminary results from monitoring surveys completed in 2002 found nearly 20 new and active southern Idaho ground squirrel population sites. In addition, a CCAA was approved in 2002 with a private landowner that covers southern Idaho ground squirrel conservation on nearly 17,402 ha (43,000 ac). Conservation actions include translocation of ground squirrels from other areas into unoccupied, suitable habitat and implementation of conservation measures, including eliminating direct killing (i.e., shooting, poisoning, trapping), habitat maintenance and improvement, and restrictions on actions that disturb ground squirrels (i.e., cultivation) at occupied sites. The Service, IDFG, and OSC have initiated development of a programmatic conservation agreement covering all non-federal land within the historical range of the species with four landowners ready to sign up. All of these conservation actions, in combination with the discovery of some new, additional population sites, lead us to downgrade threats to non-imminent and change the listing priority number for this review to 6.

FOR RESUBMITTED PETITIONS:

a. Is listing still warranted? Yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes

c. Is a proposal to list the species as threatened or endangered in preparation? No

d. If the answer to c. above is no, provide an explanation of why the action is still precluded:

In January 2001, the Service was petitioned to list the Southern Idaho ground squirrel under the Endangered Species Act (Biodiversity Legal Foundation 2001). We considered the information provided in the petition in making our previous finding for this species. Since publication of the 2002 CNOR, the publication of a proposed rule to list this species has been precluded by other higher priority listing actions, and based on work scheduled we expect that will remain the case for the remainder of Fiscal Year 2004. Almost the entire national listing budget has been consumed by work on various listing actions taken to comply with court orders and court-approved settlement agreements, emergency listing, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of the southern Idaho ground squirrel as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

LAND OWNERSHIP

From the population site data provided by Yensen (2000b) and Yensen and Haak (2000) during their survey work, 219 individual population sites were located using GPS equipment (not including the approximately 30 new population sites discovered in 2002). Using Arcview GIS Version 3.2a, Kibler (2000) plotted these sites using a map projection based on 1:100,000 minute scale and utilized the IDL, Land Ownership theme to determine comparisons. Of the 219 sites, 85 percent (186) were determined to be private lands mostly ranches and farms, 12 percent (26) were under Federal management by BLM, and 3 percent (7) were management jurisdiction of the IDL. However, the above ownership analysis requires some explanation so that one understands this is a macro-analysis and is subject to error. Under the landownership theme, tracts under 16 ha (40 ac) in size were omitted. Therefore, some of the squirrel population site locations may fall within one or more of these tracts and may reflect ownership

discrepancies. The scale of the ownership boundary can cause erroneous recording of land ownership. Another factor to consider is that field locations of squirrels represent a single point or several points with a polygon. They do not reflect the home range of the squirrels living in a specific area, which may overlap several landowners/managers. This multiple landownership overlap is not reflected in the above data comparison. A site-by-site delineation would serve to correct these discrepancies.

PRELISTING

The Service has supported four range-wide population surveys of southern Idaho ground squirrels during the past 20 years. The information from these surveys, additional data collected from annual monitoring since 2000, and information from the petition form the basis on which the Service initiated this Candidate Species Form. The BLM, in cooperation with the IDFG, initiated a survey for squirrels on BLM managed lands in the summer of 2000 and 2001 to determine the location of active population sites of squirrels. The results of the survey are being used as a factor to consider in consolidating Federal, State, and private lands for more cost efficient management and access purposes. BLM has plans for these surveys to continue for another year. The Idaho Power Company initiated a habitat reclamation study plan in cooperation with BLM at one population site. The Service co-sponsored a symposium with other agencies and Albertson College on the Conservation Biology of Ground Squirrels and the Shrub-Steppe Ecosystem on March 30, 2001.

In 2002, a CCAA was approved with the Soulen Livestock Company that covers southern Idaho ground squirrel conservation on approximately 17,402 ha (43,000 ac). A total of 125 squirrels were trapped and removed from the Rolling Hills Golf Course (59 in 2001 and 66 in 2002) and translocated to private property owned by the Soulen Livestock Company covered under the CCAA. Population monitoring of this translocated population indicates that about 1/3 -1/2 of the population did survive the translocation. Reproduction within population was verified in the summer of 2002. Graduate students from Boise State University have conducted intensive population monitoring, dispersal and translocation studies during the field season in 2003 and will continue these studies in 2004 to determine what are the most successful translocation techniques (Barrett 2003a), (Barrett 2003b), and (Panek 2003).

An additional 31 southern Idaho ground squirrels were trapped from the Rolling Hills Golf Course in 2002 and translocated to Zoo Boise to begin a propagation and education program. This program proved to a success with 24 young being produced in the spring of 2003 (Warner 2003). These were captured and released at a site on BLM lands which was already occupied by about 20 squirrels. Six of the zoo squirrels had radio transmitters attached and were tracked until they went into hibernation. The results of the control studies at the zoo and in the field will be applied to developing additional conservation measures for the species.

Other conservation actions include eliminating direct killing (i.e., shooting, poisoning, trapping), habitat maintenance and improvement, and restrictions on actions that disturb ground squirrels (i.e., cultivation) at occupied colony sites. The Service, IDFG, and OSC have initiated development of similar agreements with two other private landowners, and are also developing a programmatic conservation agreement covering all non-Federal land within the historical range of the species. Under this programmatic agreement, private landowners could sign up and be

covered under the agreement if they are willing to implement conservation measures on their property.

Updated comprehensive GIS maps that include southern Idaho ground squirrel population sites, habitat and landownership maps have been prepared by the BLM for interagency and student applications. This GIS maps will also help BLM prioritize fire suppression efforts and resources where ground squirrels are found. An interagency 5-year habitat reclamation study was initiated in 2002. Experimental vegetation plots (10 acres/plot for six plots) have been planted and monitoring begun in 2003. The habitat reclamation studies will provide key information to be applied after range fire events to optimize seed mixtures of shrubs, forbs and grasses that will favor forage and cover habitat for ground squirrels and a diversity of other native species.

Two master degree level graduate students began comprehensive studies on the demography, dispersal, and habitat use of southern Idaho ground squirrels. A third master degree student has completed genetics sampling of over 600 squirrels and will defend her master degree thesis on ground squirrel conservation genetics in the spring of 2004 (Garner and Rachlow 2003). The results of her study can be applied to both southern and northern Idaho ground squirrels. In cooperation with the Service, IDFG, and Boise State University, Zoo Boise has built a propagation/research/and educational live exhibit for southern Idaho ground squirrels. A guide to ground squirrels of the northwest was completed in 2003 and will provide an excellent educational guide for visitors at Zoo Boise, for Project Wild, a high school teachers program in Idaho, and is available for distribution to educational facilities and to National Wildlife Refuges (Yensen and Sherman 2003).

Additionally, the Service is providing cost-share funding to IDFG who has hired a non-game biologist. One of this person's assignments will be assist in conservation efforts for both the northern Idaho ground squirrel and the southern Idaho ground squirrel projects.

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LISTING PRIORITY (place * after number)

Threat			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6*
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:

The magnitude of threat has diminished since surveys were initiated in 1999 due to the discovery of previously unknown active population sites. Surveys for additional sites will continue each spring for the next 3- 5 years. Even though habitat degradation is pervasive in many areas of this species range, suitable habitat areas that can support southern Idaho ground squirrels still persist. Conservation and habitat rehabilitation actions have begun in some areas, and in 2001 and 2002, over 100 squirrels were captured from the Weiser Golf Course (the largest known colony site) and translocated to suitable habitat on lands covered by a Candidate Conservation Agreement with Assurances. These actions, in combination with other conservation and research actions described above, lead us to conclude that the magnitude of threats, while still high, is trending towards a moderate to low range.

Imminence:

The southern Idaho ground squirrel is more broadly distributed throughout its range than was previously known. While there is still concern for genetic constriction and isolation due to generally low numbers of individuals at existing sites, natural dispersal is occurring at some sites, and translocation efforts are being implemented each year. Based on the recent conservation efforts described in detail above, it seems apparent there is now some commitment by various agencies and parties to initiate and implement conservation actions on behalf of the

southern Idaho ground squirrel. These actions, in combination with other conservation and research actions described above, lead us to change the imminence of threats to non-imminent.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Dale B. Hall March 12, 2004
Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams April 5, 2004
Director, Fish and Wildlife Service Date

Do not concur: _____ _____
Director, Fish and Wildlife Service Date

Director's Remarks: _____

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_____

Date of annual review: 1/31/03
Conducted by: Rich Howard

Comments: _____

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